

In the Drawings:

Please substitute the attached eight sheets of formal drawings, including Figures 1-9, for the original drawing sheets.

In the Claims:

Please cancel claims ~~2-40~~ and add the following new claims:

1 41. (New) A self-configuring telephone interface unit, comprising:

2 a switch matrix, settable to any of a plurality of switch configurations, each switch
3 configuration coupling a plurality of signal lines from a handset port of a
4 telephone to a plurality of signal lines from a headset, the plurality of signal
5 lines from the handset port including a handset port receive path, the plurality
6 of signal lines from the handset including a headset receive path; and a control
7 logic, coupled to the switch matrix, that automatically determines which of the
8 plurality of signal lines from the handset port comprise the handset port receive
9 path, determines a preferred switch configuration from among a plurality of
10 switch configurations based upon which of the plurality of signal lines from the
11 handset port comprise the handset port receive path, and sets the switch matrix
12 to the preferred switch configuration, the preferred switch configuration
13 coupling the handset port receive path to the headset receive path.

1 42. (New) The interface unit of claim 41 wherein:

2 the switch matrix comprises a plurality of switches, each of the plurality of switches
3 coupling one handset port signal line with one headset signal line;
4 each switch configuration in the plurality of switch configurations comprises a
5 predetermined setting for each of the plurality of switches; and,
6 the control logic sets the switch matrix to a switch configuration by setting the

7 plurality of switches to the predetermined setting for the switch configuration.

1 43. (New) The interface unit of claim 42 wherein:

2 each of the plurality of switches comprises a FET switch; and
3 the control logic comprises an FET gate driver that sets the FET switches.

1 44. (New) The interface unit of claim 41 wherein:

2 the switch matrix comprises a plurality of relays, the plurality of relays coupling the
3 plurality of handset port signal lines to the plurality of headset signal lines;
4 each switch configuration in the plurality of switch configurations comprises a
5 predetermined setting for each of the plurality of relays; and,
6 the control logic sets the switch matrix to a switch configuration by setting the
7 plurality of relays to the predetermined setting for the switch configuration.

1 45. (New) The interface unit of claim 41 wherein:

2 the switch matrix is based on a cascading architecture.

1 46. (New) The interface unit of claim 41 further comprising:

2 a signal level detector that generates an output signal, the output signal indicating a
3 level of an input signal to the signal level detector; a detector switch matrix,
4 settable to any of a plurality of detector switch configurations, each detector
5 switch configuration coupling the signal level detector input to signal lines
6 from among the plurality of signal lines from the handset port; the control logic
7 further for setting the detector switch matrix to a first detector switch
8 configuration from among the plurality of detector switch configurations; for
9 receiving a first output signal from the signal level detector, the first output
10 signal generated in response to a test signal received by the handset port receive
11 path; and for determining, based on the first output signal from the signal level

12 detector, whether the signal lines coupled by the first detector switch
13 configuration comprise the handset port receive path.

1 47. (New) The interface unit of claim 46 wherein:
2 the test signal comprises a dial tone.

1 48. (New) The interface unit of claim 46 wherein the signal level detector comprises:
2 an AC voltage detector which receives the input signal to the signal level detector;
3 and,
4 an A/D converter coupled to the AC voltage detector, the A/D converter generating the
5 output signal of the signal level detector.

1 49. (New) The interface unit of claim 46 further comprising:
2 a variable gain circuit for modifying an amplitude of a signal transmitted on a headset
3 transmit path;
4 the plurality of signal lines from the handset port further including a handset port
5 transmit path; and
6 a control logic further for alternately coupling the headset transmit path and a handset
7 transmit path to the handset port transmit path; for setting the detector switch
8 matrix to a detector switch configuration which couples the handset port
9 transmit path to the signal level detector input; for receiving second and third
10 output signals from the signal level detector, the second output signal generated
11 in response to an audio test signal transmitted by the handset transmit path, the
12 third output signal generated in response to the audio test signal transmitted by
13 the headset transmit path; and for adjusting a gain of the variable gain circuit in
14 response to the second and third output signals until a gain of the headset
15 transmit path is substantially equal to a gain of the handset transmit path.

1 50. (New) The interface unit of claim 41 wherein:

2 the interface unit further comprises a variable gain circuit for modifying an amplitude
3 of a signal transmitted on a headset transmit path; and, the control logic further
4 automatically adjusts a gain of the variable gain circuit until a gain of the
5 headset transmit path is substantially equal to a gain of a handset transmit path.

1 51. (New) A self-configuring telephone interface unit, comprising:

2 a switch matrix, settable to any of a plurality of switch configurations, each switch
3 configuration coupling a plurality of signal lines from a handset port of a
4 telephone to a plurality of signal lines from a headset, the plurality of signal
5 lines from the handset port including a handset port receive path, the plurality
6 of signal lines from the handset including a headset receive path; a variable
7 gain circuit for modifying an amplitude of a signal transmitted on a headset
8 transmit path switchably coupled to a handset port transmit path; a handset
9 transmit path switchably coupled to the handset port transmit path; and a
10 control logic, coupled to the switch matrix, that automatically sets the switch
11 matrix to a preferred switch configuration from among the plurality of switch
12 configurations, the preferred switch configuration coupling the handset port
13 receive path to the headset receive path; and the control logic couples the
14 handset port transmit path alternately to the headset transmit path and to the
15 handset transmit path; receives a first gain signal and a second gain signal from
16 the handset port transmit path; and adjusts the gain of the variable gain circuit
17 in response to the first and second gain signals, the first gain signal generated
18 by an audio test signal transmitted by the handset transmit path, the second gain
19 signal generated by the audio test signal transmitted by the headset transmit
20 path.

1 52. (New) The interface unit of claim 51 further comprising:

2 a handset switch for switchably coupling the handset transmit path to the handset port
3 transmit path;
4 the plurality of signal lines from the handset port further including the handset port
5 transmit path; and
6 the control logic further for switchably coupling the handset transmit path to the
7 handset port transmit path by setting the handset switch.

1 53. (New) The interface unit of claim 52 wherein:

2 the handset switch comprises a FET switch; and,
3 the control logic comprises a FET gate driver for gating the FET switch.

1 54. (New) The interface unit of claim 51 wherein:

2 the plurality of signal lines from the handset port further includes the handset port
3 transmit path;
4 the plurality of signal lines from the headset further includes the headset transmit path;
5 and
6 the control logic further switchably couples the headset transmit path to the handset
7 port transmit path by setting the switch matrix.

1 55. (New) The interface unit of claim 51 further comprising:

2 a signal generator for generating a signal on the headset receive path, the signal
3 indicating that the audio test signal may be transmitted.

1 56. (New) A self-configuring headset and telephone interface unit, comprising:

2 a headset; a switch matrix, settable to any of a plurality of switch configurations, each
3 switch configuration coupling a plurality of signal lines from a handset port of
4 a telephone to a plurality of signal lines from a headset, the plurality of signal
5 lines from the handset port including a handset port receive path, the plurality

6 of signal lines from the headset including a headset receive path; and, a control
7 logic, coupled to the switch matrix, that automatically determines which of the
8 plurality of signal lines from the handset port comprise the handset port receive
9 path, determines a preferred switch configuration from among the plurality of
10 switch configurations based on which of the plurality of signal lines from the
11 handset port comprise the handset port receive path, and sets the switch matrix
12 to the preferred switch configuration, the preferred switch configuration
13 coupling the handset port receive path to the headset receive path.

1 57. (New) In a telephone interface unit comprising a switch matrix settable to any of a
2 plurality of switch configurations, a method for automatically configuring the telephone
3 interface unit comprising:

4 receiving a test signal on a handset port receive path; setting the switch matrix to each
5 of at least two switch configurations; for each of the at least two switch
6 configurations, measuring a signal on the headset receive path resulting from
7 the test signal; and automatically setting the switch matrix to a preferred switch
8 configuration from among the at least two switch configurations, the preferred
9 switch configuration corresponding to the signal on the headset receive path
10 with either a minimum or a maximum value.

1 58. (New) The method of claim 57 wherein:

2 measuring the signal on the headset receive path comprises measuring a signal level of
3 the signal; and the preferred switch configuration corresponds to the signal on
4 the headset receive signal path with a maximum signal level.

1 59. (New) The method of claim 57 further comprising:

2 receiving a first audio test signal on a handset transmit path; receiving a second audio
3 test signal on a headset transmit path; alternately receiving a first gain signal

4 and a second gain signal in succession, the first gain signal generated in
5 response to the first audio test signal and indicating a first gain of the handset
6 transmit path, the second gain signal generated in response to the second audio
7 test signal and indicating a second gain of the headset transmit path; and,
8 adjusting a third gain in the headset transmit path in response to the first and
9 second gain signals until the first gain is substantially equal to the second gain.

1 60. (New) The method of claim 59 further comprising:

2 generating an audio signal to signal a human to enable the audio sources.

1 61. (New) The method of claim 59 wherein adjusting the third gain comprises:

2 adjusting the third gain until an amplitude of the first gain signal is substantially equal
3 to an amplitude of the second gain signal.

1 62. (New) The method of claim 61 wherein adjusting the third gain comprises:

2 setting the third gain to a minimum amplitude for the third gain; and, incrementally
3 increasing the third gain until an amplitude of the first gain signal is
4 substantially equal to an amplitude of the second gain signal.

1 63. (New) In a telephone interface unit comprising a switch matrix settable to any of a
2 plurality of switch configurations for interfacing a handset port of a telephone to a headset,
3 the handset port coupled to the interface unit by a handset port receive path and a handset
4 port transmit path, the headset coupled to the interface unit by headset receive path and a
5 headset transmit path, a method for automatically configuring the interface unit comprising:

6 receiving a test signal on a handset port receive path; setting the switch matrix to each
7 of at least two switch configurations; for each of the at least two switch
8 configurations, measuring a signal on the headset receive path resulting from
9 the test signal; automatically setting the switch matrix to a preferred switch